

### **REMARKS**

Claims 1-22 are currently pending in the subject application, and are presently under consideration. Claims 1-22 are rejected. Claims 1, 3-12, 14-16, 18, 20, and 21 have been amended. New claim 23 has been added. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

#### **I. Specification**

In the Office Action dated August 3, 2009 (hereinafter, "Office Action"), the Examiner objects to the Title of the Invention by stating that the title is not descriptive, and that a new title is required that is clearly indicative of the novel feature(s) of the invention to which the claims are directed (Office Action, page 2). Representative for Applicant respectfully disagrees and respectfully submits that there is no such requirement in the MPEP or otherwise for the Title of the Invention to be clearly indicative of the novel feature(s) of the invention to which the claims are directed, as stipulated by the Examiner. The only requirements for the Title of the Invention that are described in the MPEP are that the title cannot exceed 500 characters, should be located at the top of the first page, and should be brief but technically accurate (37 CFR 1.72; MPEP §606). The Title of the Invention of the Present Application is "Medical Imaging Apparatus", which adequately satisfies these requirements in that it is both brief and technically accurate. If the Examiner wishes to maintain such an objection, Representative for Applicant respectfully requests the Examiner to suggest a new Title of the Invention. Otherwise, withdrawal of the objection to the Title of the Invention is respectfully requested.

#### **II. Claim Objections**

Claims 1-22 have been objected to due to informalities. Claims 1, 3, and 8-10 have been amended as suggested by the Examiner to correct the identified informalities. Accordingly, withdrawal of the objection to claims 1-22 is respectfully requested.

**III. Rejection of Claims 1-22 Under 35 U.S.C. §112, First Paragraph**

Claims 1-22 stand rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the enablement requirement. Claim 1 has been amended to change the phrase "scanning means for causing a scan of a target area of a patient," to "means for scanning a target area of a patient." Therefore, claim 1 should now be in compliance with the enablement requirement of 35 U.S.C. §112, first paragraph. Withdrawal of the rejection of claim 1 under 35 U.S.C. §112, first paragraph, is respectfully requested.

With regard to claim 6, FIG. 13 has been amended to switch the locations of the Bessel Beam and the Gaussian Beam with respect to the Axicon. The arrangement of the Gaussian Beam and Bessel Beam with respect to the Axicon prior to the amendment in FIG. 13 is in error. Such an amendment does not introduce new matter to the Application, as the correct arrangement is described in the Present Application (see Present Application, paragraphs 9 and 55). In addition, it is known in the art that axicons convert Gaussian beams to Bessel beams (see, e.g., <http://en.wikipedia.org/wiki/Axicon>). Furthermore, claim 7 has been amended for technical accuracy in accordance with the amendment to FIG. 13. Therefore, claim 6 should now be in compliance with the enablement requirement of 35 U.S.C. §112, first paragraph. Withdrawal of the rejection of claim 6 under 35 U.S.C. §112, first paragraph, is respectfully requested.

With regard to claim 21, the Examiner asserts that "[t]he basing of the non-uniformity of the sensitivity profile of the collection path on any feature related to the focal spot of the scanning means is not described in the disclosure," (Office Action, page 3). Representative for Applicant respectfully disagrees. The Present Application describes in great detail that the sensitivity profile of the collected radiation along the collection path can have a Gaussian profile or a Bessel profile (Present Application, FIGS. 2, 5, 9, 10, 13, 14, and 16; particularly FIG. 9; paragraphs 8, 9, 45, 46, 53, and 55). As is well known and easily ascertainable from the Present Application, both Gaussian and Bessel distribution functions have non-uniform magnitudes. In the Present Application, such a non-uniformity of the sensitivity profile is provided with respect to the Gaussian sensitivity profile in FIG. 9. Specifically FIG. 9 of the Present Application

shows that the sensitivity profile changes (contrast 62 with 64, particularly between them) across and along the collection path 20 based on known changes in a location of a focal spot of the scanning means along the collection path 20. Such non-uniformity applies equally to both Gaussian distributions and to Bessel distributions (Present Application, inset of FIG. 13). Representative for Applicant also respectfully submits that a claim term that is not used or defined in the specification is not indefinite if the meaning of the claim term is discernible. *Bancorp Services, L.L.C. v. Hartford Life Ins. Co.*, 359 F.3d 1367, 1372 (Fed. Cir. 2004). Therefore, despite the term "non-uniform" being explicitly absent from the Specification and originally filed claims, the use of the term is well supported in the Present Application for the above reasons and because the meaning of the claim term is readily discernible. As a result, for all of these reasons, claim 21 is compliant with the enablement requirement of 35 U.S.C. §112, first paragraph. Withdrawal of the rejection of claim 21 under 35 U.S.C. §112, first paragraph, is respectfully requested.

In addition to rejecting claims 1, 6, and 21 as violating the enablement requirement of 35 U.S.C. §112, first paragraph, the Examiner fails to adequately address these claims as required in the MPEP. Specifically, with regard to claim 6, the Examiner states that "[i]n view of the degree of non-enablement of the features recited in claims 6 and 7, they cannot be further treated in view of the prior art herein," and with regard to claim 21, the Examiner states that "[d]ue to the lack of support in the disclosure, the claim cannot be treated further in view of the prior art," (Office Action, page 3). Representative for Applicant respectfully submits that the Examiner has inadequately examined the claims of the Present Application based on these statements.

The MPEP states that "[t]he examiner ordinarily should reject each claim on all valid grounds available," that, "[m]ajor technical rejections on grounds such as lack of proper disclosure, lack of enablement, serious indefiniteness and *res judicata* should be applied where appropriate even though there may be a seemingly sufficient rejection on the basis of prior art," and that "a rejection on the grounds of *res judicata*, no *prima facie* showing for reissue, new matter, or inoperativeness (not involving perpetual motion) should be accompanied by rejection on all other available grounds," (MPEP, §707.07(g)). Furthermore, the MPEP states that "[e]ach

claim (i.e., each "invention")...must be evaluated on its own merits for compliance with all statutory requirements," (MPEP, §2107.02; emphasis added), and that "[t]he examiner's action will be complete as to all matters..." (MPEP, 37 CFR 1.104(2), §707.07). Therefore, for all of these reasons, it is improper for the Examiner to not evaluate and examine the claims under all applicable statutes. Consideration and allowance of claims 7 and 21 is respectfully requested.

#### **IV. Rejection of Claims 1-22 Under 35 U.S.C. 112, Second Paragraph**

Claims 1-22 stand rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. Specifically, the Examiner asserts that the omitted elements are elements configured to "generate and display an image as set forth in the preamble of claim 1," (Office Action, page 3). The Examiner also asserts that the "present claims set forth nothing more than elements configured to collect and detect radiation, without the radiation source and imaging elements required to render the system an 'imager'," (Office Action, page 3). Representative for Applicant respectfully disagrees, and respectfully submits that the Examiner has confused the applicable laws in this rejection.

To support this rejection, the Examiner relies on MPEP §2172.01. This section of the MPEP states that "[a] claim which omits matter disclosed to be essential to the invention as described in the specification or in other statements of record may be rejected under 35 U.S.C. §112, first paragraph, as not enabling," (MPEP §2172.01). Representative for Applicant respectfully submits that neither the Specification nor any statements or record indicate that the generation or display of an image is essential to the invention. The Present Application states that an image may be displayed on a computer (Present Application, paragraph 40). However, in neither this section nor any other section is the computer essential to the inventive aspects of the Present Application. The MPEP also states that, in determining whether an unclaimed feature is critical, the entire disclosure must be considered, and that a rejection based on the grounds that a disclosed critical limitation is missing from a claim should be made only when the language of the specification makes it clear that the limitation is critical for the invention to function as

intended (MPEP, §2164.08(c)). The MPEP further states that broad language in the disclosure, including the abstract, omitting an allegedly critical feature, tends to rebut the argument of criticality (MPEP, *Id.*). Representative for Applicant respectfully submits that one isolated statement that an image can be displayed on a computer does not rise to the level of an explicit and clear statement that such display is critical for the invention to function as intended. Therefore, Representative for Applicant respectfully submits that the generation and display of an image is not an omitted essential step with respect to claim 1.

In addition, Representative for Applicant respectfully submits that a medical imaging apparatus, such as the medical imaging apparatus described by claim 1, does not necessarily generate images, *per se*, such that generating and displaying images is not essential to the invention defined by claim 1. Paragraph 2 of the Present Application describes that "[m]edical imaging using infrared imaging or thermography to obtain passive and non-invasive measurements of human body temperature is an established technique," (Present Application, paragraph 2). The Present Application thus describes that medical imaging devices are configured to measure temperatures of the human body, and that they do so in a *passive* manner (emphasis added). The "radiation source" to which the Examiner refers is the human body itself, which is indeed recited in the preamble of claim 1. However, the preamble of claim 1 does not recite "elements configured to generate and display an image," in contrast to that which the Examiner asserts. Therefore, the preamble of claim 1 does not set forth required elements that are omitted from claim 1.

Further support for the functionality of imaging devices can be found extrinsically. As an example, an electronic imager is defined as "an electronic device that detects electromagnetic radiation with spatial resolution," ([http://en.wikipedia.org/wiki/Electronic\\_imager](http://en.wikipedia.org/wiki/Electronic_imager)). As another example, medical imaging is described such that "[m]easurement and recording techniques which are not primarily designed to produce images...but which produce data susceptible to be represented as maps (i.e. containing positional information), can be seen as forms of medical imaging," ([http://en.wikipedia.org/wiki/Medical\\_imaging](http://en.wikipedia.org/wiki/Medical_imaging)). In none of these descriptions, nor in the description provided in the Present Application itself, is it stated that the generation and

display of images is required, such as to render claim 1 incomplete based on omitting essential features.

Furthermore, the Examiner's rejection is deficient as it is based on an incorrect application of law. Specifically, the cited section of the MPEP that is relied upon by the Examiner stipulates that a rejection based on omitted matter disclosed to be essential to the invention is the basis for an enablement rejection under 35 U.S.C. §112, first paragraph, and not a lack of particularly pointing out and distinctly claiming the subject matter which the applicant regards as the invention under 35 U.S.C. §112, second paragraph. Therefore, even assuming *arguendo* that the lack of generating and displaying an image can be considered an essential feature to claim 1, the Examiner's rejection of claim 1 is incorrect.

The section of the MPEP cited by the Examiner in the rejection of claim 1 also states that "a claim which fails to interrelate essential elements of the invention as defined by applicant(s) in the specification may be rejected under 35 U.S.C. §112, second paragraph, for failure to point out and distinctly claim the invention," (MPEP §2172.01). Representative for Applicant respectfully submits that, despite this cited section of the MPEP describing the rejection that the Examiner applied to claim 1, this portion of the cited section of the MPEP is inapplicable to claim 1. Particularly, the elements of claim 1 are adequately interrelated with respect to each other, in that none of the elements are isolated with respect to each other.

For all of these reasons, claim 1 does not omit essential steps, such that claim 1 satisfies all of the requirements of 35 U.S.C. §112, first and second paragraphs. Withdrawal of the rejection of claim 1, as well as claims 2-22 which depend therefrom, is respectfully requested.

**V. Rejection of Claims 4-7, 9-12, 14-16, 18, 20 and 21 Under 35 U.S.C. 112, Second Paragraph**

Claims 4-7, 9-12, 14-16, 18, 20 and 21 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter of the invention. Claims 4-7, 11, 12, 14-16, 18, 20, and 21 have been amended to satisfy 35 U.S.C. §112, second paragraph. Withdrawal of the rejection of claims 4-7, 11, 12, 14-16, 18,

20, and 21 is respectfully requested. Representative for Applicant also notes that claims 11 and 12 are not specifically rejected in any other portion of the Office Action (*i.e.*, in view of any of the cited art). Therefore, Representative for Applicant respectfully requests a statement of record to indicate that claims 11 and 12 are allowable in view of the cited art pending the withdrawal of the rejection of claims 11 and 12.

With respect to claim 9, the Examiner asserts that "it is unclear what is being set forth by the recitation 'sweep the collection path through 360°'," and that "the specification describes the scanning means as being rotated by a motor separate from the scanning means, but does not describe the scanning means itself as being operable to rotate (*i.e.*, 'sweep')," (Office Action, page 4). Representative for Applicant respectfully disagrees.

The Specification and Drawings of the Present Application clearly demonstrate the rotation of the scanning means through the collection path, as recited in claim 9. Specifically, FIG. 5 demonstrates a rotating mirror 14 that is rotated about an axis, as indicated by the arrow 18, to sweep 360° along the collection path 12 (Present Application, FIG. 5; paragraphs 41 and 51). The scanning means (*i.e.*, the mirror 14) is thus clearly demonstrated as being rotated (*e.g.*, by a motor) to sweep the collection path 12 through 360°, as indicated by FIG. 5 and the associated portions of the Specification. Accordingly, claim 9 is not unclear, and is therefore in compliance with 35 U.S.C. §112, second paragraph. Withdrawal of the rejection of claim 9 under 35 U.S.C. §112, second paragraph, is respectfully requested.

**VI. Rejection of Claims 1-4, 6, 8-10, 20, and 22 Under 35 U.S.C. §103(a)**

Claims 1-4, 6, 8-10, 20, and 22 stand rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,407,292 to Edrich ("Edrich") in view of U.S. Patent No. 6,777,684 to Volkov ("Volkov"). Withdrawal of this rejection is respectfully requested for at least the following reasons.

With regard to claim 1, the Examiner states that "the collected radiation of Edrich inherently has some sensitivity profile along the collection path, and the recitation of 'defined'

does not structurally distinguish the recited collector from that of the prior art," (Office Action, page 5). Representative for Applicant respectfully disagrees.

In interpreting the language of a claim, the Federal Circuit has decided that claims must be given their broadest reasonable interpretation consistent with the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005). The Present Application provides adequate meaning and support to describe what is meant by the element "that the collected radiation has a *defined* sensitivity profile across and along substantially the entire length of the collection path." Specifically, the Present Application describes that "[i]n this context, the sensitivity profile is *defined* in that its general form is known along the whole of the collection path," (Present Application, paragraph 8; emphasis added). Such interpretation of the term "defined" recited in claim 1 is consistent with the plain meaning definition of the word "defined", in that "defined" is past tense, such that the sensitivity profile of the collected radiation has already defined (*i.e.*, is known) for the collection path based on the language of claim 1. Accordingly, Representative for Applicant respectfully submits that it is improper for the Examiner to disregard the use of the word "defined" in claim 1 with respect to the sensitivity profile of the collected radiation along the collection path. Representative for Applicant further respectfully submits that, in contrast to the Examiner's assertion, Edrich fails to teach or suggest that the collected radiation has a defined sensitivity profile across and along substantially the entire length of the collection path, as recited in claim 1, to one of ordinary skill in the art.

Edrich describes an imager that has a feedhorn and reflector in a near-field focusing arrangement to focus thermal radiation to a spot that indicates depth of temperature measurement based on a separation of the visible light beams (Edrich, col. 2, ll. 48-55 and 58-61; col. 3, ll. 60-64). The reflector height is automatically adjusted based on the desired depth of temperature measurement, and scanning is performed in a raster fashion along a line and orthogonal to that line (Edrich, col. 2, line 62 through col. 3, line 4). The teachings of Edrich are thus directed to a near-field focused arrangement that scans the thermal radiation at a known focal point that corresponds to the desired depth of thermal measurement.



In a near-field focusing arrangement, such as taught by Edrich, beam shape varies strongly with propagation distance, causing irregularity/asymmetry in the beam pattern at distances away from the focal plane. Support for this can be found in a number of sources. One such source describes the distinction between near-field and far-field focusing as follows:

In the far or Fraunhofer region, the measureable field components are transverse to the radial direction from the antenna and all power flow is directed radially outwards. In the far field the shape of the field pattern is independent of the distance. In the near or Fresnel region, the longitudinal component of the electric field may be significant and power flow is not entirely radial. In the near field, the shape of the field pattern depends, in general, on the distance. (*Antennas*, J.D. Kraus, McGraw Hill, 2<sup>nd</sup> Edition, 1988, page 60).

The system of Edrich overcomes the variation of beam shape as a function of propagation distance by automatically adjusting the height of the reflector to maintain the desired depth of thermal measurement (Edrich, col. 2, line 62 through col. 3, line 4). Thus, there is no indication that Edrich contemplates antenna design considerations in overcoming beam shape variation as a function of propagation distance. In the Present Application, however, a fundamental Gaussian mode beam is implemented in scanning, which maintains its Gaussian intensity profile at all distances as it propagates through near and far fields, thus resulting in the defined sensitivity profile across and along substantially the entire length of the collection path, as recited in claim 1 (see, *e.g.*, Present Application, paragraph 45). In contrast, the collected radiation of Edrich maintains a uniform beam shape as it is being scanned based on the automatic adjustment of the height of the reflector to maintain the desired thermal measurement depth. If Edrich can be considered to disclose any sort of sensitivity profile of the collected radiation, such sensitivity profile would be constant, and thus the scanner is defining such sensitivity profile, as opposed to the sensitivity profile being defined (*i.e.*, known) along the collection path. Thus, The disclosure of Edrich provides no teaching or suggestion of scanning methods or implementations to result in comparable scanning that provides a defined sensitivity profile. Therefore, Edrich does not teach or suggest that the collected radiation has a defined sensitivity profile across and along

substantially the entire length of the collection path, as recited in claim 1, to one of ordinary skill in the art.

The Examiner also states that Edrich lacks isolation means in the path of the collected radiation for preventing signal leakage from the detector being emitted towards a patient's body (Office Action, page 6). The Examiner relies on Volkov to disclose this element of claim 1 by stating that "Volkov teaches placement of a quasi-optical isolator 21 between the field of view and the detector for the purpose of directing the radiation towards the imaging plane, which is interpreted to constitute prevention of signal leakage as claimed (Office Action, page 6; citing Volkov, col. 3, line 67 through col. 4, line 3). Representative for Applicant respectfully disagrees.

Volkov discloses that a quasi-optical element is disposed between the field of view and a multi-element receiver, and the quasi-optical element directs radiation from the field of view toward an imaging plane (Volkov, col. 3, line 67 through col. 4, line 3). The quasi-optical element to which Volkov refers is disclosed as merely being a lens that projects an image onto a receiver array (Volkov, col. 8, ll. 58-60). Thus, the quasi-optical *element* that is disclosed by Volkov is not a quasi-optical *isolator* (*i.e.*, isolation means, as recited in claim 1). Specifically, a lens does not prevent signal leakage from the apparatus into the collection path, as does the isolation means recited in claim 1 (see also Present Application, paragraph 10). There is no indication in the disclosure of Volkov that the disclosed lens provides the claimed signal leakage prevention. Instead, the lens of Volkov merely focuses the image onto the receiver array. Accordingly, Volkov does not teach or suggest isolation means in the path of the collected radiation for preventing signal leakage from the detector being emitted towards the patient's body, as recited in claim 1.

For the reasons described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1 to one of ordinary skill in the art. Withdrawal of the rejection of claim 1, as well as claims 2-22 which depend therefrom, is respectfully requested.

With regard to claim 2, the Examiner asserts that Volkov discloses a corrugated feedhorn (Office Action, page 6; citing col. 65, ll. 55-56). Representative for Applicant respectfully

submits that the cited section of Volkov discloses a feedhorn, but fails to disclose that the feedhorn is a corrugated feedhorn, as recited in claim 2. Therefore, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 2 to one of ordinary skill in the art. Withdrawal of the rejection of claim 2 is respectfully requested.

With regard to claim 4, the Examiner asserts that it is known in the art that a corrugated feedhorn produces a Gaussian beam (Office Action, page 6). Representative for Applicant respectfully disagrees, and respectfully submits that the Examiner has provided no support from the cited art or anywhere else for such an assertion. Furthermore, since the Examiner cites no source for the statement that it is known in the art that a corrugated feedhorn produces a Gaussian beam, such statement must be based upon personal knowledge. Thirty-seven C.F.R. §1.104(d)(2) states that:

When a rejection in an application is based on facts within the personal knowledge of an employee of the Office, the data shall be as specific as possible, and the reference must be supported, when called for by the applicant, by an affidavit of such employee, and such affidavit shall be subject to contradiction or explanation by the affidavits of the applicant and other persons.

If the above rejection is maintained, Representative for Applicant, at this time, requests an affidavit of the Examiner to support the Examiner's statement pursuant to 37 C.F.R.

§1.104(d)(2). Absent such affidavit, Representative for Applicant respectfully submits that neither Edrich nor Volkov, individually or in combination, teach or suggest claim 4 to one of ordinary skill in the art. Withdrawal of the rejection of claim 1, as well as claims 2-22 which depend therefrom, is respectfully requested.

With regard to claim 6, the Examiner appears to reject claim 6 for the same reasons as claim 1. However, in rejecting claim 6, the Examiner fails to address the language of claim 6. In other words, the Examiner has provides no citation to the cited art to support that the collector collects the collected radiation having a Bessel sensitivity profile, as recited in claim 6, is taught or suggested by the cited art. Representative for Applicant respectfully submits that none of the

cited art teaches or suggests claim 6. Withdrawal of the rejection of claim 6 is respectfully requested.

With regard to claim 9, the Examiner asserts that the deflector of Edrich constitutes a reflector, and it is capable of being manually rotated about an arbitrary axis along a complete circular path (Office Action, page 6). Representative for Applicant respectfully disagrees, and respectfully submits that there is no indication whatsoever in the disclosure of Edrich to support such an assertion. Edrich discloses that "[s]canning is performed in a raster fashion in a line (Y-direction) and orthogonal to that line (X-direction) by automatic movements of the arm supporting the reflector and the radiometer," (Edrich, col. 2, line 67 through col. 3, line 4). This section of Edrich explicitly discloses that the scanning operation of the system of Edrich is NOT based on rotation, but is instead performed in straight line paths in an X-Y coordinate plane. There is no disclosure in Edrich that the disclosed deflector is capable of rotational movement for purposes of scanning. Therefore, Edrich fails to teach or suggest the scanning means is operable to repeatedly sweep the collection path through 360°, as recited in claim 9, to one of ordinary skill in the art. Accordingly, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 9 to one of ordinary skill in the art. Withdrawal of the rejection of claim 9 is respectfully requested.

With regard to claim 10, in contrast to that which is asserted by the Examiner, Edrich fails to disclose that the scanning means comprises a deflector that is rotatable about one axis to scan the collection path in a scanning direction across a body for substantially the reasons described above regarding claim 9. In addition, the Examiner asserts that "the recitation 'to scan the collection path...' is nothing more than a recitation of intended use, which is not given patentable weight," (Office Action, page 6). Representative for Applicant respectfully disagrees, and respectfully submits that the phrase "to scan the collection path in a scanning direction across a body," as recited in claim 10, is not intended use, but is instead a functional limitation that supports the recited structure. In other words, the claimed phrase provides a functional basis for the recited structure. The MPEP states that "[a] functional limitation is an attempt to define something by what it does, rather than by what it is," and that "[a] functional limitation must be

evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used," (MPEP, §2173.05(g)). Therefore, Representative for Applicant respectfully submits that the MPEP requires that the claimed phrase "to scan the collection path in a scanning direction across a body," as recited in claim 10, be given patentable weight, and that none of the cited art teaches or suggests claim 10 to one of ordinary skill in the art. Withdrawal of the rejection of claim 10 is respectfully requested.

With regard to claim 20, the Examiner asserts that claim 20 is rejected for the reasons described above regarding claims 2 and 4, and that "a beam having a profile which is symmetrical and reduced about a given spot along a collection path", as recited in claim 20, corresponds to a Gaussian beam (Office Action, page 6). Representative for Applicant respectfully disagrees, and respectfully submits that this assertion by the Examiner is technically inaccurate and that the Examiner has failed to address the language of claim 20 in its entirety. Claim 20 recites that a spot on the collection path resides on a focal plane of the scanning means, such that the sensitivity profile is symmetrical and reduced about the spot along the collection path. The rejection of claim 20 by the Examiner fails to address the relationship between the focal plane of the scanning means and the sensitivity profile along the collection path. Particularly, claim 20 describes the sensitivity profile *along the length of the collection path*, as well as the geometry of the sensitivity profile with respect to the focal plane of the scanning means, and is thus not merely describing a Gaussian beam. Therefore, the rejection of claim 20 is deficient in that the language of claim 20 has not been adequately addressed, particularly with respect to the cited art.

In addition, Representative for Applicant respectfully submits that it would not have been obvious for one of ordinary skill in the art to combine the teachings of Edrich and Volkov to achieve the combination of elements of claim 20. Specifically, as described above, Edrich discloses automatically adjusting the height of the reflector to maintain a desired depth of thermal measurement to prevent beam shape variation (Edrich, col. 2, line 62 through col. 3, line 4). Thus, the scan of Edrich results in a uniform beam along a collection path. Therefore, even

assuming *arguendo* that Volkov or any other cited art disclosed a beam having a profile which is symmetrical and reduced about a given spot along a collection path, such a beam would not be combinable with the system of Edrich because the system of Edrich teaches against beams having a variation along a collection path in a scan. Accordingly, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 20 to one of ordinary skill in the art. Withdrawal of the rejection of claim 20 is respectfully requested.

With regard to claim 22, for the reasons described above regarding claim 1, Representative for Applicant respectfully submits that Volkov fails to disclose a quasi-optic isolator, as recited in claim 22. Accordingly, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 22 to one of ordinary skill in the art. Withdrawal of the rejection of claim 22 is respectfully requested.

#### **VII. Rejection of Claim 5 Under 35 U.S.C. §103(a)**

Claim 5 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov as applied to claim 1, and further in view of U.S. Patent N. 5,953,644 to Kool, et al. ("Kool"). Claim 5 depends from claim 1. As described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claim 5 depends, to one of ordinary skill in the art. The addition of Kool does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 1. Therefore, Edrich, Volkov, and Kool, individually or in combination, do not teach or suggest claim 5 to one of ordinary skill in the art. Withdrawal of the rejection of claim 5 is respectfully requested.

#### **VIII. Rejection of Claim 13 Under 35 U.S.C. §103(a)**

Claim 13 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov as applied to claim 1, and further in view of U.S. Patent No. 5,760,397 to Huguenin, et al. ("Huguenin '397"). Claim 13 depends from claim 1. As described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claim 13 depends, to one of ordinary skill in the art. The addition of Huguenin '397 does not cure the deficiencies

of Edrich and/or Volkov to teach or suggest claim 1. Therefore, Edrich, Volkov, and Huguenin '397, individually or in combination, do not teach or suggest claim 13 to one of ordinary skill in the art.

In addition, the Examiner rejects claim 13 reciting the frequency range of 90-100 GHz based on overlapping ranges of 8-36 GHz, as taught by Edrich, and 30-300 GHz, as taught by Huguenin '397. The frequency range disclosed in claim 13 obviates the frequency range taught by Edrich, and Representative for Applicant respectfully submits that the disclosed range of 30-300 GHz taught by Huguenin '397 is insufficient to render obvious the frequency range of 90-100 GHz, as recited in claim 13.

The Federal Circuit has decided that, if the reference's disclosed range is so broad as to encompass a very large number of possible distinct compositions, this might present a situation analogous to the obviousness of a species when the prior art broadly discloses a genus. *In re Harris*, 409 F.3d 1339, 74 USPQ2d 1951 (Fed. Cir. 2005). See also *In re Baird*, 16 F.3d 380, 29 USPQ2d 1550 (Fed. Cir. 1994); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); MPEP § 2144.08. The frequency range recited in claim 13 (*i.e.*, spanning 10 GHz) is significantly narrower than the range disclosed in Huguenin '397 (*i.e.*, spanning 270 GHz), and should thus be considered a species of the broad genus disclosed in Huguenin '397. In addition, the Present Application is directed to subcutaneous imaging, and states that "the 90-100 GHz band gives a reasonable compromise between penetration depth and spatial resolution," (Present Application, page 12, ll. 26-28). In contrast, the system of Huguenin '397 is directed to detection of non-metallic weapons and explosives concealed under clothing (Huguenin '397, col. 1, ll. 9-16). Therefore, the frequency range recited in claim 13 is critical to the use described in the Present Application to achieve the intended results. The Federal Circuit has decided that criticality of a range can be used to rebut a *prima facie* case of obviousness based on an overlapping range. See, *e.g.*, *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990). As a result, the frequency range disclosed in Huguenin '397 does not render claim 13 obvious. Accordingly, neither Edrich nor Huguenin '397, individually or in combination, teach or suggest claim 13. Withdrawal of the rejection of claim 13 is respectfully requested.

**IX. Rejection of Claim 14, 15, 17, and 18 Under 35 U.S.C. §103(a)**

Claim 14, 15, 17, and 18 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov as applied to claim 1, and further in view of U.S. Patent No. 5,047,783 to Huguenin, et al. ("Huguenin '783"). Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claims 14 and 15 depend from claim 1. As described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claims 14 and 15 depend, to one of ordinary skill in the art. The addition of Huguenin '783 does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 1. Therefore, Edrich, Volkov, and Huguenin '783, individually or in combination, do not teach or suggest claims 14 and 15 to one of ordinary skill in the art.

In addition, the Examiner asserts that a calibration load in a millimeter wave imaging system that is effective to enable noise cancellation for enhancing image resolution, as described in Huguenin '783 is equivalent to at least one calibration load (Office Action, page 7; citing Huguenin '783, col. 2, ll. 8-46). Representative for Applicant respectfully disagrees, and respectfully submits that not only has the Examiner failed to address the language of claim 14 adequately and in its entirety, but that noise cancellation is not equivalent to calibration. Specifically, claim 14 recites at least one calibration load for emitting millimeter wave radiation at a pre-determined intensity, the collector being operable to direct said radiation to the detector to enable the imager to be calibrated. Huguenin '783 discloses that noise cancellation is accomplished by detecting and cancelling background noise (Huguenin '783, col. 2, ll. 8-46). This noise cancellation that is described in Huguenin '783 is completely irrelevant to calibration of a detector in an imaging system. Therefore, Huguenin '783 fails to teach or suggest at least one calibration load for emitting millimeter wave radiation at a pre-determined intensity, the collector being operable to direct said radiation to the detector to enable the imager to be calibrated, as recited in claim 14. Furthermore, in the Office Action, the Examiner likewise fails to address the language of claim 15, which recites that the calibration load is provided in the



collection path of the imager, so that the imager can be calibrated for each pass of the collector. Representative for Applicant respectfully submits that Huguenin '783 fails to teach or suggest claim 15 to one of ordinary skill in the art. For all of these reasons, Edrich, Volkov, and Huguenin '783, individually or in combination, do not teach or suggest claims 14 and 15 to one of ordinary skill in the art. Withdrawal of the rejection of claims 14 and 15 is respectfully requested.

Claims 17 and 18 depend from claim 1. As described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claims 17 and 18 depend, to one of ordinary skill in the art. The addition of Huguenin '783 does not cure the deficiencies of Edrich and/or Volkov to teach or suggest claim 1. Therefore, Edrich, Volkov, and Huguenin '783, individually or in combination, do not teach or suggest claims 17 and 18 to one of ordinary skill in the art. Withdrawal of the rejection of claims 17 and 18 is respectfully requested.

**X. Rejection of Claims 16 and 19 Under 35 U.S.C. §103(a)**

Claims 16 and 19 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Edrich and Volkov and Huguenin '783 as applied to claim 14, and further in view of U.S. Patent No. 5,231,404 to Gasiewski ("Gasiewski"). Claim 16 depends from claim 14, and claim 19 depends from claim 1. As described above, neither Edrich nor Volkov, individually or in combination, teach or suggest claim 1, from which claim 19 depends, to one of ordinary skill in the art. As also described above, Edrich, Volkov, and Huguenin '783, individually or in combination, do not teach or suggest claim 14, from which claim 16 depends, to one of ordinary skill in the art. The addition of Gasiewski does not cure the deficiencies of Edrich, Volkov, and/or Huguenin '783 to teach or suggest claims 1 and 14. Therefore, Edrich, Volkov, Huguenin '783, and Gasiewski, individually or in combination, do not teach or suggest claims 16 and 19 to one of ordinary skill in the art.

In addition, in rejecting claim 16, the Examiner fails to address the specific language of claim 16 in rejecting claim 16 in view of Gasiewski. Specifically, Gasiewski discloses that, in a spaceborne or airborne imaging system, a hot calibration load and a cold calibration load are

used to calibrate the channels of the imaging system, and that the calibration loads are mounted for rotation about a feedhorn axis to provide known brightness temperature calibration vectors (Gasiewski, col. 3, ll. 38-67). However, the rejection of claim 16 in the Office Action neglects to address that the temperatures straddle a range of subcutaneous body temperatures to be imaged, as recited in claim 16. The temperatures that are disclosed in Gasiewski of the calibration load are disclosed only as being "hot" and "cold", which are arbitrary based on a failure of Gasiewski to disclose a relationship between them and an object to be imaged. Furthermore, because the system of Gasiewski is an airborne or spaceborne imaging system, the temperatures that are selected for the "hot" and "cold" calibration loads are not disclosed as straddling a range of subcutaneous body temperatures to be imaged, as recited in claim 16. Representative for Applicant thus respectfully submits that it would not have been obvious to one of ordinary skill in the art to combine the system of Gasiewski with the systems of Edrich, Volkov, and/or Huguenin '783 to achieve the combination of elements of claim 16. Accordingly, Edrich, Volkov, Huguenin '783, and Gasiewski, individually or in combination, do not teach or suggest claim 16 to one of ordinary skill in the art. Withdrawal of the rejection of claim 16 is respectfully requested.

With regard to claim 19, the Examiner asserts that Edrich teaches scanning at a plurality of indexed steps, and that Gasiewski teaches scanning an object by rotating scanning means along a circumferential collection path (Office Action, page 8; citing Edrich, no column or lines; Gasiewski, FIG. 3). Representative for Applicant respectfully disagrees, and again respectfully submits that the Examiner has failed to adequately address the language of claim 19 with respect to the cited art. Specifically, claim 19 recites that the scanning means scans the target area of the patient such that the collection path is in the form of a circumference of a notional cylinder at each of a plurality of indexed steps. In rejecting claim 19, the Examiner discusses only scanning along a circumferential collection path, fails to address that *the collection path* is in the form of a circumference of a notional cylinder, as recited in claim 19 (emphasis added). Therefore, the rejection of claim 19 is deficient.

In addition, as described above, Gasiewski describes an airborne or spaceborne imaging system (Gasiewski, Abstract). In the system of Gasiewski, Blackbody loads rotate about an axis to calibrate the imaging system, which is unrelated to the scan itself, and a parabolic reflector can be rotated by a motor (Gasiewski, col. 6, ll. 36-39; col. 7, ll. 53-58). However, the scan that is achieved by the arrangement of the motor and the parabolic antenna for imaging targets in the context of radio astronomy (Gasiewski, col. 2, ll. 10-21) is such as to generate scans that are *conical swaths* to image the far-away targets from a satellite or aircraft (Gasiewski, col. 7, ll. 22-24; col. 9, ll. 25-28; col. 11, ll. 22-40), and not circumferential paths. Therefore, contrary to the Examiner's assertion, Gasiewski fails to teach or suggest scanning along a circumferential collection path, as recited in claim 19.

Furthermore, as described above, Edrich discloses that "[s]canning is performed in a raster fashion in a line (Y-direction) and orthogonal to that line (X-direction) by automatic movements of the arm supporting the reflector and the radiometer," (Edrich, col. 2, line 67 through col. 3, line 4). Therefore, Representative for Applicant also respectfully submits that it would not have been obvious to one of ordinary skill in the art to combine the teachings of Edrich and Gasiewski to achieve the combination of elements of claim 19. Specifically, it would not have been obvious to one of ordinary skill in the art to combine the X-Y plane raster scanning device of Edrich with the conical scanning parabolic dish antenna to achieve a scanning means that scans the target area of the patient such that the collection path is in the form of a circumference of a notional cylinder at each of a plurality of indexed steps, as recited in claim 19. The Examiner's rejection of claim 19 based on the combination of Edrich and Gasiewski is lacking in articulated reasoning and rational underpinning to support the legal conclusion of obviousness, as required by *KSR*. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). For these reasons, Edrich, Volkov, Huguenin '783, and Gasiewski, individually or in combination, do not teach or suggest claim 19 to one of ordinary skill in the art. Withdrawal of the rejection of claim 19 is respectfully requested.

**CONCLUSION**

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Please charge any deficiency or credit any overpayment in the fees for this amendment to our Deposit Account No. 20-0090.

Respectfully submitted,

Date 29 December 2009

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